

The image shows a 64x64 grid of binary symbols, likely representing the state of a cellular automaton. The symbols are arranged in a repeating pattern of four columns. The first column contains 'SSS' symbols. The second column contains 'SSSS' symbols. The third column contains 'SSSSS' symbols. The fourth column contains 'SSSSSS' symbols. The symbols are arranged in a staggered, wave-like pattern across the grid.

\*\*FILE\*\*ID\*\*PDAT

N 1

PPPPPPPP P DDDDDDDD AAAAAAA TTTTTTTTTT  
PPPPPPPP D DDDDDDDD AAAAAAA TTTTTTTTTT  
PP PP DD DD AA AA TT  
PP PP DD DD AA AA TT  
PP PP DD DD AA AA TT  
PPPPPPPP DD DD AA AA TT  
PPPPPPPP DD DD AA AA TT  
PP DD DD AAAAAAAAAA TT  
PP DD DD AAAAAAAAAA TT  
PP DD DD AA AA TT  
PP DD DD AA AA TT  
PP DDDDDDDD AA AA TT  
PP DDDDDDDD AA AA TT

.....  
.....

LL I II III SSSSSSSS  
LL I II III SSSSSSSS  
LL I II SS SS  
LL I II SS SS  
LL I II SSSSSS SSSSSS  
LL I II SSSSSS SSSSSS  
LL I II SS SS  
LL I II SS SS  
LL I II SS SS  
LLLLLLLLLL I II III SSSSSSSS SSSSSSSS

PDA  
VO

(1)	82	DECLARATIONS
(1)	276	STACKS FOR NULL AND SWAPPER PROCESS
(1)	293	NULL PROCESS HEADER AND PCB
(1)	306	SWAPPER PROCESS HEADER AND PCB
(1)	322	SYSTEM PCB
(1)	331	PCB ADDRESS VECTOR

0000 1 .TITLE PDAT PROCESS DATA BASE  
0000 2 .IDENT 'V04-000'  
0000 3 :\*\*\*\*\*  
0000 4 :\*\*\*\*\*  
0000 5 :\*  
0000 6 :\* COPYRIGHT (c) 1978, 1980, 1982, 1984 BY  
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0000 24 :\*  
0000 25 :\*\*\*\*\*  
0000 26 :\*  
0000 27 :++  
0000 28 :FACILITY: EXECUTIVE, PROCESS DATA BASE  
0000 29 :  
0000 30 :ABSTRACT: PDAT ALLOCATES AND INITIALIZES THE STORAGE FOR THE  
0000 31 : PROCESS DATA BASE, WHICH CONTAINS THE PCB, PHD AND STACK FOR  
0000 32 : THE NULL PROCESS AND SWAPPER PROCESS.  
0000 33 :  
0000 34 :ENVIRONMENT:  
0000 35 :  
0000 36 :  
0000 37 :AUTHOR: RICHARD I. HUSTVEDT , CREATION DATE: 23-NOV-76  
0000 38 :  
0000 39 :MODIFIED BY:  
0000 40 :  
0000 41 : V03-007 LJK0288 Lawrence J. Kenah 9-Aug-1984  
0000 42 : The AUTHPRI field is located in both the PCB and the PHD.  
0000 43 :  
0000 44 : V03-006 TMK0001 Todd M. Katz 24-Aug-1983  
0000 45 : Create the SWAPPER with a UIC of [1,4].  
0000 46 :  
0000 47 : V03-005 KFH0001 Ken Henderson 20 May 1983  
0000 48 : Set PCB\$V\_PHDRES for NULL and SWAPPER  
0000 49 :  
0000 50 : V03-004 CWH1008 CW Hobbs 14-May-1983  
0000 51 : Add cell SCH\$GW\_LOCALNODE to hold the node bits for the  
0000 52 : local cluster node.  
0000 53 :  
0000 54 : V03-003 ACG0319 Andrew C. Goldstein, 22-Mar-1983 21:26  
0000 55 : Add resource attribute to UIC in process rights list  
0000 56 :  
0000 57 : V03-002 ACG0318 Andrew C. Goldstein, 8-Mar-1983 19:50

## PROCESS DATA BASE

D 2

16-SEP-1984 00:55:06 VAX/VMS Macro V04-00  
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(1)

0000	58	:	Add initial rights lists to null and swapper PCB's
0000	59	:	
0000	60	:	V03-001 CWH1001 CW Hobbs 15-Feb-1983
0000	61	:	Add cells for last PID created and width of PIX field of PID
0000	62	:	(SCH\$GL_PIXLAST and SCH\$GL_PIXWIDTH).
0000	63	:	
0000	64	:	V02-005 LJK0097 Lawrence J. Kenah 3-Dec-1981
0000	65	:	Initialize all priority fields in PCB and PHD for
0000	66	:	both swapper and null process.
0000	67	:	
0000	68	:	V02-004 LJK0067 Lawrence J. Kenah 15-Sep-1981
0000	69	:	Move kernel stacks for SWAPPER and NULL so that they are
0000	70	:	adjacent to FCP data area. This prevents the exception and
0000	71	:	bugcheck code from overwriting valuable data when the system
0000	72	:	is manually crashed while the null process is executing.
0000	73	:	
0000	74	:	V02-003 SRB0029 Steve Beckhardt 17-Jul-1981
0000	75	:	Added code to initialize lock queue header to GENPCB macro
0000	76	:	
0000	77	:	V02-002 KTA0024 Kerbey T. Altmann 30-Jun-1981
0000	78	:	Cause SWAPPER to start up with its PCB addr in R4.
0000	79	:	
0000	80	--	

```

0000 82 .SBTTL DECLARATIONS
0000 83
0000 84 : INCLUDE FILES:
0000 85 : INCLUDE FILES:
0000 86 :
0000 87     $ARBDEF          ; ACCESS RIGHTS BLOCK DEFINITIONS
0000 88     $DYNDEF          ; DYNAMIC DATA STRUCTURE TYPE DEFINITIONS
0000 89     $PCBDEF          ; PROCESS CONTROL BLOCK DEFINITIONS
0000 90     $PHDDEF          ; PROCESS HEADER DEFINITIONS
0000 91     $SGNDEF GLOBAL   ; DEFINE SYSGEN VALUES
0000 92     $STATEDEF        ; DEFINE STATE NUMBERS
0000 93
0000 94 :***** Temporary ARB definitions until SDL is fixed to expand
0000 95 :***** substructure names correctly.
0000 96 :
0000 97 ARBSR_RIGHTSLIST=32
0000 98 ARBSR_RIGHTSDESC=48
0000 99 :***** END OF TEMPORARY DEFINITIONS
0000 100
0000 101 :
0000 102 : EXTERNAL SYMBOLS:
0000 103 :
0000 104 :
0000 105 SCHSC_MAXPIX==SGNSC_NPROCS-1 ; MAXIMUM PIX
0000 106
0000 107 :
0000 108 : MACROS:
0000 109 :
0000 110     .LIST    MEB
0000 111     .MACRO   PHD      SYM
0000 112     .=PHD...+PHDS'SYM
0000 113     .ENDM    PHD
0000 114
0000 115     .MACRO   PCB      SYM
0000 116     .=PCB...+PCBS'SYM
0000 117     .ENDM    PCB
0000 118
0000 119
0000 120 :
0000 121 : MACRO TO GENERATE PCB
0000 122 :
0000 123     .MACRO   GENPCB LBL,UIC=0,PHD,PRIORITY,PID,PNAME
0000 124
0000 125     .ALIGN   QUAD
0000 126 PCB...=.
0000 127 LBL==.
0000 128     .BLKB    PCBSC_LENGTH
0000 129 SAV...=. ; SAVE FOR CONTINUATION
0000 130
0000 131     PCB      L_SQFL
0000 132     .LONG
0000 133     .LONG   :-4
0000 134
0000 135     PCB      W_SIZE
0000 136     .WORD   PCBSC_LENGTH
0000 137
0000 138     PCB      B_TYPE

```

```

0000 139 .BYTE DYN$C_PCB
0000 140 PCB B_ASTEN
0000 141 .BYTE ^XOF
0000 142 PCB L_ASTQFL
0000 143 .LONG :-4
0000 144 PCB L_PHYPBCB
0000 145 .LONG PRD-^X80000000+PHDSL_PCB ; PHYSICAL PCB ADDRESS
0000 146 PCB L_UIC
0000 147 .LONG UIC,1 ; UIC FOR PROCESS, RESOURCE FLAG
0000 148 PCB W_STATE
0000 149 .WORD SCHSC_CUR ; SET STATE TO CURRENT
0000 150 PCB L_STS
0000 151 .LONG <T@PCB$V_RES>+<1@PCB$V_PSWAPM>+<1@PCB$V_PHDRES>
0000 152 LU = . ; RESIDENT, NON-SWAPPABLE, HEADER-RESIDENT
0000 153 .LONG
0000 154 PCB B_PRIB ; BASE PRIORITY
0000 155 .BYTE 3T-PRIORITY
0000 156 PCB B_AUTHPRI ; INITIAL BASE PRIORITY
0000 157 .BYTE 3T-PRIORITY
0000 158 PCB B_PRI ; CURRENT PRIORITY
0000 159 .BYTE 3T-PRIORITY
0000 160 PCB B_PRIBSAV ; SAVED BASE PRIORITY
0000 161 .BYTE 3T-PRIORITY
0000 162 PCB B_PRISAV ; SAVED CURRENT PRIORITY
0000 163 .WORD 6 ; ALLOW REASONABLE LIMIT
0000 164 PCB W_DIOCM ; ALLOW DIO
0000 165 .WORD 6
0000 166 PCB L_PID ; PROCESS ID
0000 167 .LONG PID+<1@16>
0000 168 PCB L_PHD ; PROCESS HEADER
0000 169 .LONG PHD
0000 170 PCB Q_PRIV ; PROCESS PRIVILEGES
0000 171 .LONG -1,-1 ; ALL PRIVILEGES
0000 172 ARB = . ; ACCESS RIGHTS BLOCK
0000 173 PCB L_ARB
0000 174 .LONG ARB
0000 175
0000 176
0000 177
0000 178
0000 179
0000 180
0000 181
0000 182
0000 183
0000 184
0000 185
0000 186
0000 187
0000 188
0000 189
0000 190 ARB = .
0000 191 .LONG -1,-1
0000 192 PCB L_ARB
0000 193 .LONG ARB
0000 194
0000 195

```

```

0000 196 PCB Q_PRIV+ARB$R_RIGHTSDESC ; LOCAL RIGHTS DESCRIPTOR
0000 197 LR = . LONG ARB$S_LOCALRIGHTS,LU
0000 198 .LONG ARB$S_LOCALRIGHTS,LU
0000 199 PCB Q_PRIV+ARB$R_RIGHTSLIST ; PROCESS RIGHTS LIST
0000 200 .LONG LR ; LOCAL RIGHTS LIST
0000 201 .LONG EXE$GQ_RIGHTSLIST ; SYSTEM RIGHTS LIST
0000 202 .LONG
0000 203 PCB T_LNAME ; PROCESS NAME
0000 204 .NCHR NCHAR,<PNAME> ; COUNT FOR NAME
0000 205 .BYTE NCHAR
0000 206 .ASCII \PNAME\
0000 207 .ASCII \PNAME\
0000 208 PCB L_LOCKQFL ; LOCK QUEUE HEADER
0000 209 .LONG
0000 210 .LONG : -4
0000 211 .LONG : -4
0000 212 .=SAV... ; POSITION TO END OF PCB
0000 213 .ENDM GENPCB ;
0000 214 :
0000 215 :
0000 216 :
0000 217 :
0000 218 MACRO TO GENERATE PROCESS HEADER
0000 219 :
0000 220 .MACRO GENPHD LBL,KSP=0,PC=0,P0BR=<^X80000000>,POLR=0,R4=0,PRIORITY=0
0000 221 :
0000 222 .ALIGN QUAD
0000 223 PHD...=.
0000 224 LBL=.
0000 225 .BLKB PHD$C_LENGTH ; DEFINE LABEL
0000 226 SAV...=.
0000 227 .BLKB PHD$C_LENGTH ; GENERATE SPACE
0000 228 PHD R4 ; SAVE FOR CONTINUATION
0000 229 .LONG R4 ; INITIAL R4 CONTENTS
0000 230 PHD PC ;
0000 231 .LONG PC ; PROGRAM COUNTER
0000 232 PHD R4 ;
0000 233 .LONG R4 ; ALLOW EVERYTHING
0000 234 PHD Q_PRIVMSK
0000 235 .LONG -T,-1 ; POLR=0
0000 236 PHD L_POLRSTL ; P0 LENGTH REGISTER
0000 237 .LONG POLR
0000 238 PHD L_P0BR ; P0 BASE REGISTER
0000 239 .LONG P0BR
0000 240 PHD L_P1BR ; P1 BASE REGISTER
0000 241 .LONG P1BR
0000 242 PHD L_P1LR ; P1 LENGTH REGISTER
0000 243 .LONG P1LR
0000 244 PHD L_KSP ; KERNEL STACK POINTER
0000 245 .LONG KSP
0000 246 PHD B_ASTLVL ; NO PENDING AST'S
0000 247 .BYTE 4-
0000 248 .BYTE 4-
0000 249 .BYTE 4-
0000 250 .BYTE 4-
0000 251 .BYTE 4-
0000 252 .BYTE 4-

```

PROCESS DATA BASE  
DECLARATIONS

H 2

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(1)

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```
0000 253
0000 254 PHD L_FREP1VA
0000 255 .LONG ^X7FFFFE00 ; FIRST AVAIL P1 VA
0000 256
0000 257 PHD W_PHVINDEX ; ALL FREE
0000 258 .WORD -T ; BALANCE SLOT INDEX
0000 259
0000 260 PHD B_AUTHPRI ; MAKE PAGE FAULTS ILLEGAL
0000 261 .BYTE 3T-PRIORITY ; BASE PRIORITY
0000 262
0000 263 .=SAV...
0000 264 .ENDM GENPHD ;
0000 265
0000 266
0000 267 : EQUATED SYMBOLS
0000 268
00000010 0000 269 SWAP_EXT_PRIO = 16
00000010 0000 270 SYS_EXT_PRIO = 16
00000000 0000 271 NULL_EXT_PRIO = 0
00010004 0000 272 SWAP_UIC = ^X00010004
0000 273
0000 274
```

0000 276 .SBTTL STACKS FOR NULL AND SWAPPER PROCESS  
0000 277 :  
0000 278 :  
0000 279 :  
00000000 280 .PSECT \$\$S\$000\_STACKS,QUAD  
00000080 0000 281 .BLKL 32 ; SHORT STACK FOR NULL PROCESS  
00000080 0080 282 NULKSP:  
000000A0 0080 284 SWP\$K\_KSTKSZ==160  
00000300 0080 285 .BLKL SWP\$K\_KSTKSZ ; SIZE OF SWAPPER STACK  
0300 286 :  
0300 287 SWPKSP:  
0300 288 SWP\$A\_KSTK:: ; LONGER STACK FOR SWAPPER  
0300 289 :  
0300 290 :  
00000000 291 .PSECT \$\$S\$230,QUAD ; EXTERNAL NAME FOR SWAPPER STACK

	0000	293	.SBTTL NULL PROCESS HEADER AND PCB
	0000	294	:
	0000	295	HEADER (PHD) FOR NULL PROCESS
	0000	296	:
	0000	297	GENPHD NULPHD,KSP=NULKSP,PC=EXE\$NULLPROC,PRIORITY=NULL_EXT_PRIO .BLKB PHD\$C_LENGTH .=PHD...+PHD\$C_R4 .LONG 0 .=PHD...+PHDSL_PC .LONG EXE\$NULLPROC .=PHD...+PHDSQ_PRIVMSK .LONG -1,-1 .=PHD...+PHDSL_POLRASTL .LONG 0 .=PHD...+PHDSL_P0BR .LONG ^X80000000 .=PHD...+PHDSL_P1BR .LONG ^X7F802000 .LONG ^X200000 .=PHD...+PHDSL_KSP .LONG NULKSP .=PHD...+PHDSB_ASTLVL .BYTE 4 .=PHD...+PHDSL_FREP1VA .LONG ^X7FFFFEC0 .=PHD...+PHDSW_PHVINDEX .WORD -1 .=PHD...+PHDSB_AUTHPRI .BYTE 31-NULC_EXT_PRIO
FFFFFFFFFF	0000017C	0000	; PROGRAM COUNTER
	00000098	017C	: ALLOW EVERYTHING
	00000000	0098	
	00000000	009C	
	00000000	00C0	
	00000000	00C4	
	00000000	0008	
	00000000	00CC	
	00000000	00C8	
	7F802000	00D0	
	00200000	00D4	
	00000078	00D8	
	00000080	0078	
	000000CF	007C	
	04	00CF	
	00000030	00D0	
	7FFFFE00	0030	
	00000042	0034	
	FFFF	0042	
	0000010C	0044	
	1F	010C	
	0000017C	010D	
	017C	298	.=SAV...
	017C	299	:
	017C	300	PROCESS CONTROL BLOCK FOR NULL PROCESS
	017C	301	:
	017C	302	GENPCB SCH\$GL_NULLPCB,PHD=NULPHD,PID=NULPIX,- PRIORITY=NULL_EXT_PRIO,PNAME=NULL
	017C	303	
	000002A0	0180	
	00000180	02A0	
	00000180	0180	
	00000180	0184	
	0120	0188	
	0C	018A	
	0000018D	018B	
	OF	018D	
	00000190	018E	
	00000190	0190	
	00000190	0194	
	80000078	0198	
	0000023C	019C	
00000001	00000000	023C	NULPHD-^X80000000+PHDSL_PCB : PHYSICAL PCB ADDRESS
	000001AC	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	; O FOR PROCESS, RESOURCE FLAG
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
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	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4	01AE	
	00040011	01A4	
	000001AF	01AB	
	1F	01AF	
	0000	023C	
	0000	0244	
	000E	01AC	
	000001A4		

```

000001AB 01B0 .=PCB...+PCBSB_AUTHPRI
1F 01AB .BYTE 31-NUL[ EXT_PRI0
0000018B 01AC .=PCB...+PCBSB_PRI
1F 018B .BYTE 31-NUL[ EXT_PRI0
000001A9 018C .=PCB...+PCBSB_PRI$AV
1F 01A9 .BYTE 31-NUL[ EXT_PRI0
000001A8 01AA .=PCB...+PCBSB_PRISAV
1F 01A8 .BYTE 31-NUL[ EXT_PRI0
000001C0 01A9 .=PCB...+PCBSW_DIOLM
0006 01C0 .WORD 6
000001BE 01C2 .=PCB...+PCBSW_DIOCNT
0006 01BE .WORD 6
000001E0 01C0 .=PCB...+PCBSL_PID
00010000' 01E0 .LONG NULPIX<1@16>
000001EC 01E4 .=PCB...+PCBSL_PHD
00000000' 01EC .LONG NULPHD
00000204 01F0 .=PCB...+PCBSQ_PRIV
FFFFFFFFFF FFFF FFFF 0204 .LONG -1,-1
00000204' 020C .LONG ARB
00000234 0210 .=PCB...+PCBSQ_PRIV+ARB$R_RIGHTSDESC
00000040 0234 .LONG ARB$S [LOCALRIGHTS,LU
00000224 023C .=PCB...+PCBSQ_PRIV+ARB$R_RIGHTSLIST
00000234' 0224 .LONG LR
00000000' 0228 .LONG EXE$GQ_RIGHTSLIST
000001F0 022C .=PCB...+PCBST_LNAME
04 01F0 .BYTE NCHAR
4C 4C 55 4E 01F1 .ASCII '\NULL\
00000284 01F5 .=PCB...+PCBSL_LOCKQFL
00000284' 0284 .LONG :
00000284' 0288 .LONG :-4
000002A0 028C .=SAV...
02A0      .=SAV...

```

304

```

02A0 306 : .SBTTL SWAPPER PROCESS HEADER AND PCB
02A0 307 : 
02A0 308 : HEADER (PHD) FOR SWAPPER PROCESS
02A0 309 : 
02A0 310 : GENPHD SWPPHD,KSP=SWPKSP,PC=EXESSWAPINIT,-
02A0 311 : POBR=0,POLR=0,R4=SCH$GL_SWPPCB,-
02A0 312 : PRIORITY=SWAP_EXT_PRIO
          .BLKB PHDSC LENGTH ; GENERATE SPACE
          .=PHD...+PHD$C_R4
          .LONG SCH$GL_SWPPCB
          .=PHD...+PHD$L_PC
          .LONG EXESSWAPINIT ; PROGRAM COUNTER
          .=PHD...+PHD$Q_PRIVMSK
          .LONG -1,-1
          .=PHD...+PHD$L_POLRASLT ; ALLOW EVERYTHING
          .LONG 0
          .=PHD...+PHD$L_POBR
          .LONG 0
          .=PHD...+PHD$L_P1BR ; P1 LENGTH REGISTER
          .LONG ^X7F802000
          .LONG ^X200000
          .=PHD...+PHD$L_KSP ; KERNEL STACK POINTER
          .LONG SWPKSP
          .=PHD...+PHD$B_ASTLVL ; NO PENDING AST'S
          .BYTE 4
          .=PHD...+PHD$L_FREP1VA
          .LONG ^XFFFFE00 ; ALL FREE
          .=PHD...+PHD$W_PHVINDEX ; MAKE PAGE FAULTS ILLEGAL
          .WORD -1
          .=PHD...+PHD$B_AUTHPRI ; BASE SWAP EXT PRIO
          .BYTE 31-SWAP_EXT_PRIO ; POSITION TO END OF PHD
          .=SAV...
          041C 313 : 
          041C 314 : PROCESS CONTROL BLOCK FOR SWAPPER PROCESS
          041C 315 : 
          041C 316 : GENPCB SCH$GL_SWPPCB,PHD=SWPPHD,PID=SCH$C_SWPIIX,-
          041C 317 : PRIORITY=SWAP_EXT_PRIO,PNAME=SWAPPER,-
          041C 318 : UIC=SWAP_UIC
          .ALIGN QUAD
          .BLKB PCBSC LENGTH
          .=PCB...+PCB$C_SQFL
          .LONG .
          .LONG -4
          .WORD PCBSC_LENGTH
          .BYTE DYN$C_PCB
          .=PCB...+PCB$B_ASTEN
          .BYTE ^XOF
          .=PCB...+PCB$L_ASTQFL
          .LONG .
          .LONG -4
          .LONG SWPPHD-^X80000000+PHD$L_PCB ; PHYSICAL PCB ADDRESS
          00000001 00010004 04DC .=PCB...+PCB$L_UIC ; SWAP_UIC FOR PROCESS, RESO
          0000044C 04E4 .=PCB...+PCB$W_STATE
          000E 044C .WORD SCH$C_CUR
          00000444 044E .=PCB...+PCB$C_STS
          00040011 0444 .LONG <1@PCBSV_RES>+<1@PCBSV_PSWAPM>+<1@PCBSV_PHDRES>

```

0000044F	0448	.=PCB...+PCBSB_PRIB	
OF	044F	.BYTE 31-SWAP_EXT_PRIO	; BASE SWAP_EXT_PRIO
0000044B	0450	.=PCB...+PCBSB_AUTHPRI	
OF	044B	.BYTE 31-SWAP_EXT_PRIO	; INITIAL BASE SWAP_EXT_PRIO
0000042B	044C	.=PCB...+PCBSB_PRI	
OF	042B	.BYTE 31-SWAP_EXT_PRIO	; CURRENT SWAP_EXT_PRIO
00000449	042C	.=PCB...+PCBSB_PRIBSAV	
OF	0449	.BYTE 31-SWAP_EXT_PRIO	; SAVED BASE SWAP_EXT_PRIO
00000448	044A	.=PCB...+PCBSB_PRISAV	
OF	0448	.BYTE 31-SWAP_EXT_PRIO	; SAVED CURRENT SWAP_EXT_PRIO
00000460	0449	.=PCB...+PCBSW_DIOLM	
0006	0460	.WORD 6	; ALLOW REASONABLE LIMIT
0000045E	0462	.=PCB...+PCBSW_DIOCNT	
0006	045E	.WORD 6	
00000480	0460	.=PCB...+PCBSL_PID	
00010001	0480	.LONG SCHSC_SWPPIX+<1@16>	; PROCESS ID
0000048C	0484	.=PCB...+PCBSL_PHD	
000002A0	048C	.LONG SWPPHD	
000004A4	0490	.=PCB...+PCBSQ_PRIV	
FFFFFFFFFF	04A4	.LONG -1,-1	
000004A4	04AC	.LONG ARB	
000004DC	04B0	.=PCB...+PCBSQ_PRIV+ARB\$R_RIGHTSDESC	
00000040	04D4	.LONG ARBSS_LOCALRIGHTS_LU	
000004C4	04DC	.=PCB...+PCBSQ_PRIV+ARB\$R_RIGHTSLIST	
000004D4	04C4	.LONG LR	; LOCAL RIGHTS LIST
00000000	04C8	.LONG EXE\$GQ_RIGHTSLIST	; SYSTEM RIGHTS LIST
00000490	04CC	.=PCB...+PCBST_LNAME	
07	0490	.BYTE NCHAR	
52 45 50 50 41 57 53	0491	.ASCII \SWAPPER\	
00000524	0498	.=PCB...+PCBSL_LOCKQFL	
00000524	0524	.LONG :	
00000524	0528	.LONG :-4	
00000540	052C	.=SAV...	; POSITION TO END OF PCB
0540	319		
00000480	0540	320 SCH\$GL_SWPPID==SCH\$GL_SWPPCB+PCBSL_PID	; ADDRESS OF SWAPPER PID

```

0540 322 : .SBTTL SYSTEM PCB
0540 323 : GENERATE DUMMY PCB FOR SYSTEM PAGING
0540 324 :
0540 325 :
0540 326 :
0540 327 :
0540 328 GENPCB MMGSAL SYSPCB,PHD=0,-
00000660 0540 PID=0,PRIORITY=SYS_EXT_PRIO
00000540 0660 .BLKB PCB$C_LENGTH
00000540 0540 .=PCB...+PCB$C_SQFL
00000540 0544 .LONG .
0120 0548 .LONG :-4
0C 054A .WORD PCB$C_LENGTH
0000054D 054B .BYTE DYN$C_PCB
0F 054D .=PCB...+PCB$B_ASTEN
00000550 054E .BYTE ^XOF
00000550 0550 .=PCB...+PCB$L_ASTQFL
00000550 0554 .LONG .
00000550 0558 .LONG :-4
80000078 0558 .LONG 0-^X80000000+PHD$L_PCB ; PHYSICAL PCB ADDRESS
000005FC 055C .=PCB...+PCB$L_UIC
00000001 00000000 05FC .LONG 0,1 ; 0 FOR PROCESS, RESOURCE FLAG
0000056C 0604 .=PCB...+PCB$W_STATE
00000564 056C .WORD SCH$C_CUR ;
00040011 0564 .=PCB...+PCB$C_STS
0000056F 0568 .LONG <1@PCB$V_RES>+<1@PCB$V_PSWAPM>+<1@PCB$V_PHDRES>
0000056F 056F .=PCB...+PCB$B_PRIB
0000056B 0570 .BYTE 31-SYS_EXT_PRIO ; BASE SYS_EXT_PRIO
0000056B 056B .=PCB...+PCB$B_AUT$PRI
0000054B 056C .BYTE 31-SYS_EXT_PRIO ; INITIAL BASE SYS_EXT_PRIO
00000569 054C .=PCB...+PCB$B_PRI$SAV
00000569 0569 .BYTE 31-SYS_EXT_PRIO ; CURRENT SYS_EXT_PRIO
0000056B 056A .=PCB...+PCB$B_PRI5$AV
0000056B 0568 .BYTE 31-SYS_EXT_PRIO ; SAVED BASE SYS_EXT_PRIO
00000580 0569 .=PCB...+PCB$W_DIO$CM
00000580 0006 .WORD 6 ; SAVED CURRENT SYS_EXT_PRIO
0000057E 0582 .=PCB...+PCB$W_DIOCNT
000005A0 0580 .WORD 6 ; ALLOW REASONABLE LIMIT
000005A0 0580 .=PCB...+PCB$L_PID
00010000 05A0 .LONG 0+<1@16> ; PROCESS ID
000005AC 05A4 .=PCB...+PCB$L_PHD
00000000 05AC .LONG 0 ; PROCESS HEADER
000005C4 05B0 .=PCB...+PCB$Q_PRIV
0FFFFFFFFFF 05C4 .LONG -1,-1 ; ALL PRIVILEGES
000005C4 05CC .LONG ARB
000005F4 05D0 .=PCB...+PCB$Q_PRIV+ARB$R_RIGHTSDESC
00000040 05F4 .LONG ARB$S [OCALRIGHTS,LU ; LOCAL RIGHTS LIST
000005E4 05FC .=PCB...+PCB$Q_PRIV+ARB$R_RIGHTSLIST ; SYSTEM RIGHTS LIST
000005F4 05E4 .LONG LR
00000000 05E8 .LONG EXE$GQ_RIGHTSLIST
000005B0 05EC .=PCB...+PCB$T_LNAME
00 05B0 .BYTE NCHAR
00000644 05B1 .=PCB...+PCB$L_LOCKQFL
00000644 0644 .LONG :
00000644 0648 .LONG :-4
00000660 064C .=SAV... ; POSITION TO END OF PCB

```

PDAT  
V04-000

PROCESS DATA BASE  
SYSTEM PCB

0660 329

B 3

16-SEP-1984 00:55:06 VAX/VMS Macro V04-00  
5-SEP-1984 03:46:05 [SYS.SRC]PDAT.MAR;1

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VO

```

0660 331 .SBTTL PCB ADDRESS VECTOR
0660 332 :
0660 333 : NOTE: THE POINTER TO THE NULL PROCESS PCB MUST BE PROCESS
0660 334 : INDEX=0. ALL INACTIVE PCB POINTER ENTRIES ARE FILLED
0660 335 : WITH THE ADDRESS OF THE NULL PROCESS PCB TO INSURE THAT
0660 336 : THEY POINT TO A VALID PCB.
0660 337 : NOTE: MANY PLACES IN VMS ASSUME THAT THE SWAPPER IS IN THE
0660 338 : HIGHEST NUMBERED "SPECIAL" SLOT. MANY SCANS OF THE
0660 339 : PCBVEC GO FROM SCH$C_SWPPIX+1 TO THE END.
0660 340 :
00000000 0660 341 NULPIX=0 : PIX FOR NULL PROCESS
00000001 0660 342 SCH$C_SWPPIX==1 : PIX FOR SWAPPER PROCESS
0660 343 :
0660 344 :
0660 345 : VECTOR OF PROCESS CONTROL BLOCK ADDRESSES
0660 346 :
0660 347 .ALIGN LONG : LONG WORD ALIGNMENT
0660 348 SCH$GL_PCBVEC:: : POINTER TO PCB VECTOR
00000000 0660 349 .LONG 0 :
0664 350 :
0664 351 :
0664 352 : VECTOR OF SEQUENCE NUMBERS FOR PID GENERATION
0664 353 :
00000000 0664 354 SCH$GL_SEQVEC:: : POINTER TO SEQUENCE NUMBER VECTOR
0664 355 .LONG 0 :
0668 356 :
0668 357 :
0668 358 : DATA ITEMS FOR PCBVEC REFERENCES
0668 359 :
00000000 0668 360 SCH$GL_MAXPIX:: : MAXIMUM PROCESS INDEX
0668 361 .LONG 0 :
0660 362 SCH$GL_PIXLAST:: : LAST PROCESS INDEX CREATED, USED
00000001 0660 363 .LONG SCH$C_SWPPIX : IN ROUND ROBIN PID ALLOCATION.
0670 364 :
0670 365 :
0670 366 :+
0670 367 :*** The next cell contains the width of the index field in the extended (user-
0670 368 :*** visible) PID. While it is possible to find the pcb address with:
0670 369 :***
0670 370 :*** EXTZV #0, G^SCH$GL_PIXWIDTH, EPID, R0 ; Get index in R0
0670 371 :*** MOVL @G^SCH$GL_PCBVEC[R0], R0 ; R0 now has PCB addr
0670 372 :***
0670 373 :*** it is much safer to do
0670 374 :***
0670 375 :*** MOVL EPID, R0 : Extended PID to R0
0670 376 :*** JSB EXE$EPID_TO_PCB : Returns PCB addr in R0
0670 377 :***
0670 378 :*** The format of the PID is likely to change again in future releases. Calling
0670 379 :*** the routine offers a program much greater insurance against problems from
0670 380 :*** future PID changes.
0670 381 :-
00000000 0670 382 SCH$GL_PIXWIDTH:: : WIDTH OF PROCESS INDEX FIELD IN
0670 383 .LONG 0 : THE PID, DETERMINED BY SYSGEN
0674 384 :
0674 385 :
0000 0674 386 SCH$GW_LOCALNODE:: : ID FOR LOCAL CLUSTER NODE, USED
0674 387 .WORD 0 : FOR THE NODE FIELD IN THE EPID

```

PDAT  
V04-000

PROCESS DATA BASE  
PCB ADDRESS VECTOR

D 3

16-SEP-1984 00:55:06 VAX/VMS Macro V04-00  
5-SEP-1984 03:46:05 [SYS.SRC]PDAT.MAR;1

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0000 0676 388  
0676 389  
0678 390 .WORD 0

; SPARE FOR ALIGNMENT

PDAT  
V04-000

PROCESS DATA BASE  
PCB ADDRESS VECTOR

0678 392

E 3

.END

16-SEP-1984 00:55:06 VAX/VMS Macro V04-00  
5-SEP-1984 03:46:05 [SYS.SRC]PDAT.MAR;1

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PDAT  
Symbol table

PROCESS DATA BASE

F 3

16-SEP-1984 00:55:06 VAX/VMS Macro V04-00  
5-SEP-1984 03:46:05 [SYS.SRC]PDAT.MAR;1

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ARB	= 000005C4 R 03	PHD...	= 000002A0 R 03
ARB\$R_RIGHTSDESC	= 00000030	SAV...	= 00000660 R 03
ARB\$R_RIGHTSLIST	= 00000020	SCH\$C_CUR	= 0000000E
ARB\$S_LOCALRIGHTS	= 00000040	SCH\$C_MAXPIX	= 0000003F G
DYN\$C_PCB	= 0000000C	SCH\$C_SWPPIX	= 00000001 G
EXE\$GQ_RIGHTSLIST	***** X 03	SCH\$G_E_MAXPIX	= 00000668 RG 03
EXE\$NUCLPROC	***** X 03	SCH\$G_L_NULLPCB	= 00000180 RG 03
EXESSWAPINIT	***** X 03	SCH\$G_L_PCBVEC	= 00000660 RG 03
LR	= 000005F4 R 03	SCH\$G_L_FIXLAST	= 0000066C RG 03
LU	= 000005FC R 03	SCH\$G_L_PIXWIDTH	= 00000670 RG 03
MMGSAL_SYSPCB	= 00000540 RG 03	SCH\$G_L_SEQVEC	= 00000664 RG 03
NCHAR	= 00000000	SCH\$G_L_SWPPCB	= 00000420 RG 03
NULKSP	= 00000080 R 02	SCH\$G_L_SWPPID	= 00000480 RG 03
NULL_EXT_PRIO	= 00000000	SCH\$G_W_LOCALNODE	= 00000674 RG 03
NULP\$D	= 00000000 R 03	SGN\$C_BALSETCNT	= 00000018 G
NULPIX	= 00000000	SGN\$C_DFWSCNT	= 00000064 G
PCB\$B_ASTEN	= 0000000D	SGN\$C_DFWSQUOTA	= 00000078 G
PCB\$B_AUTHPRI	= 0000002B	SGN\$C_GBLSECCNT	= 00000028 G
PCB\$B_PRI	= 0000000B	SGN\$C_MAXGPGCNT	= 00000800 G
PCB\$B_PRIB	= 0000002F	SGN\$C_MAXPAGCNT	= 00004000 G
PCB\$B_PRIBSAV	= 00000029	SGN\$C_MAXPGFL	= 0001000 G
PCB\$B_PRISAV	= 00000028	SGN\$C_MAXPSTCNT	= 00000005 G
PCB\$B_TYPE	= 0000000A	SGN\$C_MAXVPGCNT	= 00002000 G
PCB\$C_LENGTH	= 00000120	SGN\$C_MAXWSCNT	= 00000400 G
PCB\$L_ARB	= 0000008C	SGN\$C_MINWSCNT	= 0000000A G
PCB\$L_ASTQFL	= 00000010	SGN\$C_NPAGEDYN	= 00006800 G
PCB\$L_LOCKQFL	= 00000104	SGN\$C_NPROCS	= 00000040 G
PCB\$L_PHD	= 0000006C	SGN\$C_PAGEDYN	= 0004000 G
PCB\$L_PHYP\$C	= 00000018	SGN\$C_PHYPAGCNT	= 0001000 G
PCB\$L_PID	= 00000060	SGN\$C_SYSDWSCNT	= 00000028 G
PCB\$L_SQFL	= 00000000	SGN\$C_SYSVECPGS	= 00000005 G
PCB\$L_STS	= 00000024	SGN\$C_SYSWSCNT	= 00000060 G
PCB\$L_UIC	= 000000BC	SWAP_EXT_PRIO	= 00000010
PCB\$Q_PRIV	= 00000084	SWAP_UIC	= 00010004
PCB\$T_LNAME	= 00000070	SWPS_A_KSTK	= 00000300 RG 02
PCB\$V_PHDRES	= 00000012	SWPS_KSTKSZ	= 000000A0 G
PCB\$V_PSWAPM	= 00000004	SWPKSP	= 00000300 R 02
PCB\$V_RES	= 00000000	SWPPHD	= 000002A0 R 03
PCB\$W_DIOCNT	= 0000003E	SYS_EXT_PRIO	= 00000010
PCB\$W_DIOLM	= 00000040		
PCB\$W_SIZE	= 00000008		
PCB\$W_STATE	= 0000002C		
PCB...	= 00000540 R 03		
PHD\$B_ASTLVL	= 000000CF		
PHD\$B_AUTHPRI	= 0000010C		
PHD\$C_LENGTH	= 0000017C		
PHD\$L_FREP1VA	= 00000030		
PHD\$L_KSP	= 00000078		
PHD\$L_P0BR	= 000000C8		
PHD\$L_POLRASTL	= 000000CC		
PHD\$L_P1BR	= 000000D0		
PHD\$L_P1LR	= 000000D4		
PHD\$L_PC	= 000000C0		
PHD\$L_PCB	= 00000078		
PHD\$L_R4	= 00000098		
PHD\$Q_PRIVMSK	= 00000000		
PHD\$W_PHVINDEX	= 00000042		

PH  
VO

+-----+  
! Psect synopsis !  
+-----+

**PSECT name**

Allocation	PSECT No.	Attributes
000000000	00 ( 0.)	NOPIC USR
000000000	01 ( 1.)	NOPIC USR
00000300	02 ( 2.)	NOPIC USR
00000678	03 ( 3.)	NOPIC USR

## **! Performance indicators !**

### Phase

Page faults	CPU Time	Elapsed Time
38	00:00:00.04	00:00:01.93
113	00:00:00.52	00:00:03.75
239	00:00:05.87	00:00:20.33
0	00:00:00.62	00:00:02.48
118	00:00:01.52	00:00:05.15
12	00:00:00.09	00:00:00.51
2	00:00:00.03	00:00:00.03
0	00:00:00.00	00:00:00.00
524	00:00:08.69	00:00:34.18

The working set limit was 1350 pages.

41207 bytes (81 pages) of virtual memory were used to buffer the intermediate code.

There were 30 pages of symbol table space allocated to hold 479 non-local and 0 local symbols.

392 source lines were read in Pass 1, producing 18 object records in Pass 2.

22 pages of virtual memory were used to define 16 macros.

## Macro library statistics

### Macro Library name

## Macros defined

\$255\$DUA28:[SYS.OBJ]LIB.MLB;1  
-\$255\$DUA2B:[SYSLIB]STARLET.MLB;2  
TOTALS (all Libraries)

600

524 GETS were required to define 9 macros.

There were no errors, warnings or information messages.

**MACRO/LIS=LI\$S:PDAT/OBJ=OBJ\$S:PDAT MSRC\$S:PDAT/UPDATE=(ENH\$S:PDAT)+EXECML\$S/LIB**

0379 AH-BT13A-SE  
VAX/VMS V4.0

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